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On favorable report of the respective committees, the following were ordered to be published :

On Colonies of PLANTS observed near Philadelphia.

BY AUBREY H. SMITH.

During the years 1864, 1865 and 1866, a large number of introduced plants, chiefly southern, were found growing on the waste grounds below the Philadelphia Navy Yard, and at Kaighn's Point and Petty's Island, on the opposite shore of the Delaware.

It has been thought by those who were engaged in the work of collection, that some account of these localities and a list of the plants themselves should be placed at the command of students investigating the subject of the introduction and naturalization of plants. To meet this view I have prepared the following pages.

The city of Philadelphia is built on a low gravelly bluff, extending along the right bank of the Delaware with little interruption from Kensington on the north to the Navy Yard on the south. It is scarcely practicable now to define accurately the limits of this bluff, but it may be stated, in general terms, that above Kensington and below the Navy Yard, it recedes from the river, and its place is supplied by tide marshes to a greater or less extent. Northward these marshes have been largely filled up and built upon, but southward the low margin of the river has been but partially reclaimed.

Immediately below the Navy Yard, the rim of tide marsh does not exceed two or three hundred yards in width. Further down the river it widens greatly, and has been banked in for agricultural and grazing purposes. Between the Navy Yard and the banked meadows, the tide flats have awaited the slow demands of commerce for their utilization.

The first step to the reclamation of the flats is the extension of the lines of the eastern streets to the line of low tide, and the building of bulk-heads of logs at their extremities below low water mark. The streets thus extended are filled up with waste earth from cellars and similar excavations, and thus causeways are made out to the bulk-heads. Next, the bulk-heads themselves are extended right and left to meet similar works from the ends of other streets. The wharf line thus built is then conveniently secured by the deposit behind it of sand and gravel ballast from coasting vessels, as well as of earth brought specially for the purpose. Behind it, there will, of course, exist a pond or lagoon, to be filled up from time to time, from the river or from the land, as materials may offer themselves on either side of it.

From Dickerson Street northward to the Navy Yard, the flats have been entirely reclaimed, and coal wharves and ship yards occupy their place. Southward of this street, at the distance of six or seven hundred feet, an earthen embankment extends Morris Street to the line of low water, and a bulk-head

carried to the left connects this causeway with the reclaimed land at Dickerson Street. A pond, not now of more than three acres in extent, lies behind the bulk-head, and communicates with the river by a covered sluice, through which the tide ebbs and flows. Between the pond and the river are some two acres of ground made by the deposit there, through many years, of sand and gravel ballast from the coasters, and of mud from the cleansing of the docks of the city. On the west and north the pond is rapidly diminishing in size, as waste materials from the city are cast into it, and in a few years it will no doubt wholly disappear. The marshes formerly existing above Dickerson Street have been reclaimed by the same process, and those below Morris Street will in time be dealt with in a similar manner. Upon the reclaimed land behind the bulk-head between Dickerson and Morris Streets have been found the greater part of the plants enumerated in this list. This locality, which for convenience we have called the Ballast Ground, did not exist fifteen years ago, for the bulk-head which protects it from the river has itself been built within that period. Some of the plants may, however, have existed in similar places along the river for a long time. Muhlenberg, in his catalogue published in 1813, mentions *Senebiera didyma* and *Cynodon Dactylon* as plants of Pennsylvania, though since his day they have only been found, so far as I have learned, at or near this place. *Salsola Kali* is not rare in the waste grounds about Philadelphia, and *Atriplex hastata*, its maritime congener, is abundant in every neglected out-lot. *Pluchea camphorata* and *Aster linifolius* are firmly established in a pool, at the foot of Tasker Street, not connected with the pond behind the Ballast Ground and probably of much older date and different origin, whilst *Artemisia bienuis* is abundant in by-places for half a mile about.

The unenclosed grounds below the Navy Yard are in some respects very favorably situated for the growth of southern plants. The trend of the river shore being south by west, the whole width of the city spreads between them and the quarters from which the colder winds blow. Those of the north and north-west must pass before reaching the Navy Yard for four or five miles over houses and factories, the innumerable fires of which will at all times temper their rigor, whilst the easterly, southerly and south-westerly winds are made yet milder by the wide expanse of water over which they come. The ground too being at the level of tide offers the most favorable conditions, so far as elevation is concerned.

I regret that it has not been in my power to obtain thermometrical observations from which a comparison might be made of the average temperatures, at different seasons, of several points in a line running north-westwardly from the Navy Yard to Girard College. From these we could learn whether or not the causes I have indicated are able to produce sensible effects on the vegetation at the margin of the river. Those at Girard College are all that are needed for that station, but, there being no intermediate ones, they are of no avail for the present purpose.

Nearly opposite the Ballast Ground, on the New Jersey side of the river at Kaighn's Point, is a large enclosed ship and timber yard, which presents conditions somewhat similar to those of the locality just described. A portion of the low ground at this place has been filled in and levelled out to the wharves and bulk-heads, whilst another part of it remains nearly in its natural state. From this enclosure come the most of the plants attributed in this list to Kaighn's Point, though a few of them have been found without its limits.

Petty's Island is a tract of reclaimed alluvion on the New Jersey side of the Delaware, opposite the mouth of Cooper's Creek, which has been, to some extent, used of late years as a place of deposit for ballast, sand and other waste and rough material. It was not known as a botanical locality of interest until visited during the present year (1866) by Mr. Isaac Burk. Since his discovery of it, however, it has been constantly and carefully watched by him and other botanists, and the results of their observations are to be found herein.

Both Kaighn's Point and Petty's Island share the advantages for the growth

and naturalization of the plants of warmer climates which have been ascribed to the Ballast Grouud. Sheltered by the wide sweep of the city crescent from the colder winds, they lie at the level of tide with the broad expanse of the river, further to temper the atmosphere which reaches them.

I have been thus minute in the description of these localities, in order not only that the circumstances under which these curious colonies of strangers have taken up their abode with us may be understood, but, in the auticipation of their speedy destruction as the city extends its limits, and of the establishment of similar ones elsewhere on its outskirts, that those who shall observe such future settlements may have the means of tracing their history aud development.

The Ballast Ground locality was discovered by Messrs. Diffenbaugh and Parker in the latter part of the season of 1864; that at Kaighu's Poiut was made known about the same time by the last uamed gentlemau. Since then the plants of those places, and iu 1866 those of Petty's Island, have been carefully watched and collected by a number of botanists. Among these I may especially mention Dr. Martindale and Messrs. Burk, Diffenbaugh and Parker, to each of whom I am indebted for some of the rarest in the list.

All the plants have beeu submitted to Prof. T. C. Porter, and the determinations in all cases of difficulty have his full concurrence. Dr. Porter himself shared the work of collection.

It will be observed in many iustances that the fruit has not matured, and in some that not even the flower has appeared. This may not always have been due to the shortness of the season, but sometimes to the late deposit of the sand or gravel with which the seeds have been brought from the south.

A small number of the plants of 1864 did not re-appear in 1865, and some of those of 1865 were not found in 1866. One or two of them, threatened by the frost before flowering or fruiting, were transplauted, and developed their characters under glass. For this service we are indebted to Mr. Kilvington and Dr. Leidy.

Many plants were found growing with those enumerated in the list, which are regarded as iutroduced, but which are not strictly coufiued to the localities above described. Some of these are rare and of limited distribution. Nevertheless, but few of them have been included herein, inasmuch as this list is intended, in the main, to contain the names only of those which have not hitherto been collected in the neighborhood of Philadelphia. At a subsequent period, a supplemental catalogue may be given of such of these as shall be deemed of interest.

This list exhibits, as nearly as my information enables me to give it, the actual state of the adventive flora of the several localities in each of the years of collection; but it is proper to say that the time which has elapsed since their discovery has been too short to justify any positive assertion as to the completeness of the catalogue, or the appearance or disappearance of any of the plants named in it.

1. Erysimum o r i e n t a l e, *R. Br.* (*Brassica orientalis*, L.) Three specimens collected at Kaighn's Point in 1866. Fruit perfected. Adv. from Europe, where it is widely distributed.

2. Sinapis a l b a, *L.* A single plant, collected on the waste grounds northwest of the Ballast Ground by Mr. Diffenbaugh, on the 17th June, 1865. Fruit perfected. Adv. from Europe.

3. Senebiera d i d y m a, *Pers.* Ballast Ground and Kaighn's Point, Sept. and Oct., 1864, 1865, 1866. Abundant and in mature fruit—rather less common in the latter year. *Hab.*—North Carolina to Florida; Chapman. Also waste places at ports, &c., Virginia to Carolina—an immigrant from farther south; Gray.

4. Senebiera Coronopus, *Poir.* A single specimen collected on the Ballast Ground by Mr. Burke in 1865. Adv. from Europe.

5. Cakile Americana, *Nutt.* Ballast Ground, Sept. and Oct, 1864, 1865. Very few specimens. *Hab.*—Sea coast and Great Lakes; Gray.

6. Sagina subulata, *Torr & Gray.* (*S. Elliottii*, Fenzl.; *Spergula subulata*, Swartz).
Ballast Ground, 1865, 1866. Less frequent in the latter year. Fruit perfected in both seasons. These specimens, and others apparently of the same species from Charleston, S. C., are glandular hairy on the peduncles and calyx,—not smooth, as in S. Elliottii, according to Chapman.
In the spring of 1865, Mr. Charles E. Smith collected at Somer's Point, N. J., a slender form of S. subulata, which Dr. Gray regards as a variety, and has called, from the discoverer, var. Smithii. Dr. Gray now considers S. Elliottii not distinguishable from S. subulata.

7. Sesuvium Portulacastrum, *L.* Two small patches near the southern end of the Ballast Ground, 1865. Fruit matured. *Hab.*—Sea coast of New Jersey and Southward; Gray.

8. Sesuvium pentandrum, *Ell.* Petty's Island, 1866. Not frequent; fruit perfected. *Hab.*—Sea coast, North Carolina to Florida; Chapman.

9. Portulaca pilosa, *L.* Petty's Island, 1866. Infrequent and with fruit not fully developed. *Hab.*—Key West, Florida; Chapman.

10. Malvastrum tricuspidatum, *Gray.* Pl. Wright, Pt. I., p. 16. (M. carpinifolium, *Gray.* Pl. Feudl., p. 22.) Two specimens with imperfected fruit collected by Mr. Burk and Diffenbaugh, on the Ballast Ground, in 1865. Dr. Porter has two specimens from the same locality with perfected fruit. This plant is probably the Malva Americana of Muhlenberg's Catalogue, p. 62, where it is recorded as growing in Pennsylvania. *Hab.*—South Florida; Chapman.

11. Sida stipulata, *Cav.* A considerable number of plants scattered over the Ballast Ground, Sept. and Oct., 1864, 1865. In flower and with fruit nearly perfected. *Hab.*—Waste places about dwellings—Florida. According to DC., this plant has naturalized itself in many parts of the world.

12. Modiola multifida, *Moench.* Appeared in leaf only on the Ballast Ground late in the autumn of 1865. It was transplanted by Mr. Kilvington, and, placed under glass, produced its flowers and fruit in April, 1866. *Hab.*—North Carolina to Florida; Chapman.

13. Kosteletzkya Virginica, *Presl.* A few specimens collected on the eastern margin of the pond, but none with mature fruit. Sept. and Oct., 1865. Also at Kaighn's Point in the same year. *Hab.*—Marshes along the sea coast, from Long Island southward; Gray.

14. Gossypium herbaceum, *L.* Eastern and western margins of the pond. Oct., 1865, 1866. Flowers in both seasons, but no fruit.

15. Trifolium Carolinianum, *Mx.* Ballast Ground, 1865. Abundant and with perfect fruit Less frequent in 1866. Two specimens at Kaighn's Point in the latter year. *Hab.*—North Carolina to Florida; Chapman.

16. Melilotus parviflora, *Desf.* (*M. occidentalis*, Nutt.) Ballast Ground and Kaighn's Point, 1865, 1866. Abundant and with mature fruit in both seasons. Adv. from Europe into Western Texas and Mexico. (U. S. Boundary Survey, Emory, Vol. II., p. 55.)

17. Medicago maculata, *Willd.* Ballast Ground, collected Oct. 14, 1866. Two specimens without flower or fruit. Adv. from Europe.

18. Medicago denticulata, *Willd.* Ballast Ground, 1865, 1866. Rare, fruit perfected, more frequent in the latter year. Adv. from Europe.

19. Glottidium Floridanum, *DC.* A single plant collected on the Ballast Ground, but more frequent at Kaighn's Point. Sept. and Oct., 1865. One specimen at Petty's Island, Sept., 1866. Fruit not matured in any case. *Hab.*—South Carolina to Florida; Chapman.

20. Sesbania macrocarpa, *Muhl.* Ballast Ground, Sept. and Oct., 1865. Many specimens in full flower, but without perfect fruit. This plant and Glottidium Floridanum flowered about the 1st October, and were killed by the frost before their fruit was matured. *Hab.*—South Carolina to Florida; Chapman.

21. Ervum Lens, *L.* Federal Street wharf, Camden. Collected by Mr. Diffenbaugh, August 6th, 1865. Rare. Adv. from Europe.

22. Vigna glabra, *Savi.* Ballast Ground and Kaighn's Point, Sept. and Oct., 1865, 1866. Abundant in both places, but not perfecting its fruit. *Hab.*—Brackish marshes, from Florida to South Carolina; Chapman.

23. Cassia obtusifolia, *L.* Ballast Ground and Kaighn's Point, Sept. and Oct., 1865, 1866. A few flowering plants, but the fruit not matured. *Hab.*—North Carolina to Florida; Chapman.

24. Potentilla argentea, *L.* Collected at Kaighn's Point by Mr. Parker, June 4, 1865, with ripe fruit. Also at the Ballast Ground in 1865 and 1866. This plant has been observed in previous years near Red Bank, N. J. *Hab.*—Dry barren fields northward; Gray.

25. Potentilla anserina, *L.* Ballast Ground, 1865. A single specimen collected in flower by Mr. Diffenbaugh. *Hab.*—Brackish marshes and river banks, chiefly northward; Gray.

26. Ammania latifolia, *L.* Two specimens collected near the eastern margin of the pond by Mr. Diffenbaugh, Sept. 8, 1865. Fruit not matured. Two from the same place by Mr. Burk in 1866, with perfect fruit. It was also collected by Mr. Parker at Kaighn's Point, in 1866, in good fruit. *Hab.*—Ohio, Illinois, and southward; Gray.

27. Œnothera sinuata, *L.*, var. humifusa, *Torr* and *Gray.* Sparingly distributed on the Ballast Ground, Sept., 1866. *Hab.*—Drifting sands along the coast; Chapman.

28. Gaura sinuata, *Nutt.?* Collected on the Ballast Ground by Mr. Parker, Sept. 30, 1864. Fruit scarcely matured.

29. Jussiæa repens, *L.* Along the margin of the pond in several places; also at Kaighn's Point, 1864, 1865. In flower and with matured fruit. Kaighn's Point, 1866. Fruit perfected. Also at Petty's Island, 1866, but rare. Fruit perfected. *Hab.*—In water, Illinois, Kentucky and southward; Gray.

30. Jussiæa leptocarpa, *Nutt.* Along the margin of the pond, 1865. Several specimens, but the fruit not matured. *Hab.*—In marshes, Florida, and westward; Chapman.

31. Jussiæa decurrens, *DC.* Ballast Ground, 1865. Rare. *Hab.*—Ditches, Florida to North Carolina, and westward; Chapman.

32. Leptocaulis divaricatus, *DC.* Ballast Ground, 1865. Several specimens with perfected fruit. Kaighn's Point, 1866. Two specimens. *Hab.*—Sandy soil, North Carolina to Florida; Chapman.

33. Asperula arvensis, *L.* Ballast Ground, 1866. A single plant collected in flower, by Mr. Burk. Adv. from Europe.

34. Galium tricorne, *Host.* Ballast Ground, 1866. Collected by Mr. Burk. Larger than the European form. Adv. from Europe.

35. Diodia Virginica, *L.* Ballast Ground, 1865. Abundant and in perfect fruit. *Hab.*—Virginia and southward; Gray.

36. Oldenlandia glomerata, *Mx.* A single specimen from the Ballast Ground, but more frequent at Kaighn's Point. *Hab.*—Western Pennsylvania to Illinois, and southward; Gray.

37. Polypremum procumbens, *L.* Ballast Ground, Sept. and Oct., 1864 and 1865. Kaighn's Point, 1865, 1866. Abundant, fruit perfected. *Hab.*—Sandy fields, Virginia and southward; Chapman.

38. Eupatorium fœniculaceum, *Willd.* Growing freely on both sides of the river, Sept. and Oct., 1864, 1865. Scarcely so abundant in 1866. Fruit not matured in either season. *Hab.*—Virginia, near the coast and southward; Gray.

39. Eupatorium serotinum, *Mx.* At the eastern edge of the pond, Sept. 30, 1865. Fruit not matured. Also at Petty's Island, Sept., 1866, in flower only. *Hab.*—Illinois and southward; Gray.

40. Aster linifolius, *L.* At the foot of Tasker Street, in a pool west of and not connected with the main pond. Abundant and in perfect fruit., Oct., 1864, 1865, 1866. *Hab.*—Salt marshes, Maine to Virginia; Gray.

41. Solidago sempervirens, *L.* Eastern margin of the pond, Oct., 1865. More abundant in 1866 at the same place. Fruit matured in both years. *Hab.*—Salt marshes, Maine to Virginia; Gray.

42. Hetherotheca scabra, *DC.* Abundant on both sides of the river in Sept. and Oct., 1864, 1865, and 1866. Fruit matured. Rather less plentiful in 1866 than in the former years. *Hab.*—Sandy places along the coast of South Carolina and westward; Chapman.

43. Pluchea camphorata, *DC.* In the pool at the foot of Tasker Street, and at Kaighn's Point, Sept. and Oct., 1864, 1865, 1866. Also along the eastern margin of the main pond in the latter year. Abundant and in perfect flower and fruit. *Hab.*—Salt marshes, Massachusetts and southward; Gray.

44. Pluchea fœtida, *DC.* Kaighn's Point, 1865. Collected by Mr. Parker, in flower only, on the 21st Sept. *Hab.*—Ohio to Illinois, and southward; Gray. Florida and northward; Chapman.

45. Iva frutescens, *L.* Several specimens, collected in leaf along the western margin of the pond, Sept. and Oct., 1865. *Hab.*—Sea coast, Mass., and southward; Gray.

46. Parthenium Hysterophorus, *L.* Ballast Ground, Sept., 1864. Two specimens collected by Messrs. Parker & Diffenbaugh, in flower and young fruit. Kaighn's Point, 1866,—a single plant. *Hab.*—East and South Florida; Chapman.

47. Helenium quadridentatum, *Labill.* Ballast Ground, Oct., 1864. Rare. In flower and young fruit. Rather plentiful at Petty's Island in 1866. *Hab.*—North Carolina and westward; Gray.

48. Centaurea Calcitrapa, *L.* Kaighn's Point, 1865. Scarce. *Hab.*—Norfolk, Va.; Gray. Adv. from Europe.

49. Artemisia biennis, *Willd.* Abundant in waste places, for half a mile, about the Navy Yard, 1864, 1865, 1866. Also at Petty's Island in the latter

year, but not so plentiful. This plant, in full growth, is very much branched. *Hab.*—River banks, Ohio to Illinois, and northward; Gray.

50. Leontodon autumnale, *L.* Kaighn's Point, August, 1865, 1866. Petty's Island in the latter year. Rare. Fruit perfected. Nat. from Europe.

51. Pyrrhopappus Carolinianus, *DC.* Ballast Ground, 1864, 1865. Scarce. Kaighn's Point, 1866,—a single specimen only. *Hab.*—Sandy fields, from Maryland, southward; Gray.

62. Plantago heterophylla, *Nutt.* Ballast Ground and Kaighn's Point, 1865, 1866. Abundant in 1865. Less frequent in the latter year. Fruit perfected. *Hab.*—Maryland and Southward; Gray.

53. Anagallis arvensis, *L.*, var. cœrulea. Ballast Ground, 1866. A single specimen collected by Mr. Burk. Nat. from Europe.

54. Collinsia parviflora, *Dougl.* Ballast Ground, 1865. A single specimen collected in fruit by Mr. Burk. *Hab.*—South shore of Lake Superior, and thence westward; Gray.

55. Herpestis Monniera, *H. B. K.* Petty's Island. Collected by Mr. Burk in flower and mature fruit, on the 21st October, 1866. *Hab.*—Maryland and southward along the coast; Gray.

56. Conobea multifida, *Benth.* Ballast Ground and Kaighn's Point, Oct., 1865. Also at Petty's Island, 1866. Rare and in perfect fruit. *Hab.*—Ohio to Illinois, and southward; Gray.

57. Gerardia purpurea, *L.*, var. fasciculata, *Ell.* Ballast Ground, 1864, Oct., 1866. In flower and fruit. *Hab.*—Sea coast, South Carolina to Florida; Chapman.

58. Verbena bracteosa, *Mx.* Kaighn's Point, 1866. In flower only. Scarce. *Hab.*—River banks, Wisconsin to Kentucky, Gray.

59. Calamintha nepeta, *Link.* Ballast Ground, 1864. Two specimens collected in flower by Mr. Parker. Nat. from Europe, in Virginia and southward.

60. Heliotropium Europæum, *L.* Ballast Ground, 1864, 1865. A single specimen collected by Mr. Parker in 1864. In 1865 several additional ones in flower only. Maryland, Virginia, &c.; Gray. Nat. from Europe.

61. Heliotropium Curassavicum, *L.* Ballast Ground, 1865. A single plant growing in calcareous sand. Abundant and in full fruit at Petty's Island in 1866. *Hab.*—South Florida; Chapman.

62. Nama Jamaicensis, *L.* Ballast Ground, 1865. A single specimen in fruit. *Hab.*—South Florida; Chapman.

63. Batatas littoralis, *Chois.* Ballast Ground, Oct. 9, 1865. Several plants in early flower, but without fruit. Also in 1866, but without flowers. *Hab.* Sea coast, Florida to South Carolina; Chapman.

64. Ipomea tamnifolia, *L.* Ballast Ground, Sept. 7, 1865. A single specimen collected in flower by Mr. Burk. *Hab.*—South Carolina to Florida; Chapman.

65. Dichondra repens, *Forst.*, var. Carolinensis, *Chois.* Petty's Island. Collected by Mr. Diffenbaugh, Oct. 21, 1866, without flower or fruit. Not frequent. *Hab.*—North Carolina to Florida; Chapman.

66. Petunia parviflora, *Juss.* (Ann. Mus. 2, p. 216, t. 47.) Ballast Ground, Sept., 1864, 1865. Rather frequent. Also in 1866, but very scarce. Abundant at Petty's Island in the latter year. *Hab.*—Lower Rio Grande and

Mexican States, westward to California. (U. S. Boundary Survey, Emory, Vol. ii., Part i., p. 155.)

67. Roubieva multifida, *Moquin.* Ballast Ground, 1865. Sparingly distributed throughout the central portion of the ground. Fruit matured. Adv. from tropical America.

68. Obione arenaria. *Moquin.* Ballast Ground, 1865. A few specimens with ripe fruit. Also in 1866 but scarce. *Hab.*—Sea coast, from Massachusetts Southward; Gray.

69. Chenopodina maritima, *Moquin.* Ballast Ground, 1864—1865. Not frequent. Fruit perfected. *Hab.*—Salt marshes along the coast; Gray.

70. Euxolus pumilus, *Raf.* Ballast Ground, 1865. A single specimen collected in flower by Mr. Diffenbaugh. *Hab.*—Sea coast from Long Island Southward; Gray.

71. Polygonum minus, *Hudson.* Ballast Ground, 1866. Collected by Mr Burk. Scarce. Adv. from Europe.

72. Euphorbia polygonifolia, *L.* Ballast Ground. Rare and not in flower in 1865. In 1866 a single specimen in perfect fruit. Also at Petty's Island in 1866, one plant. *Hab.*—Shores of the Atlantic and Great Lakes; Gray.

73. Euphorbia herniarioides, *Nutt.* Ballast Ground, 1865. In fruit. Petty's Island, Oct. 21, 1866, in fruit. Frequent. *Hab.*—Banks of the Ohio and Mississippi Rivers; Gray.

74. Euphorbia Helioscopia, *L.* Ballast Ground, 1864. A single specimen. Found elsewhere in Pennsylvania, though rare. Nat. from Europe.

75. Euphorbia exigua, *L.* Kaighn's Point, 1866. Collected by Mr. Burk in fruit. Scarce. Adv. from Europe.

76. Acalypha gracilens, *Gray.* Ballast Ground and Kaighn's Point, 1865—1866. Rare in both years. Common southward.

77. Croton glandulosum, *L.* Ballast Ground, 1864, 1865, 1866. Frequent and in ripe fruit. More abundant in the last of these years. *Hab.*—Virginia, Illinois and southward; Gray.

78. Croton maritimum, *Walt.* Ballast Ground, 1865. Leaves only. *Hab.*—Drifting sands along the coast from North Carolina to Florida; Chapman.

79. Phyllanthus polygonoides, *Nutt.* Ballast Ground. A single specimen collected by Mr. Diffenbaugh, Oct. 1, 1865. Fruit scarcely perfected. *Hab.*—Along the Rio Grande and westward in Mexico, (Boundary Survey, Emory, Vol. II, p. 193.)

80. Juncus articulatus, *L.*, var. obtusior, *Engelm.* Kaighn's Point and Petty's Island, 1866. Not abundant. J. articulatus has hitherto been found in the United States only in New England and Western New York.

81. Juncus nodosus, *L*, var. megacephalus, *Tor.* Ballast Ground and Petty's Island, 1866. Not abundant. A northern plant not before found in the vicinity of Philadelphia.

82. Juncus bufonius, *L.*, var. fasciculiflorus, *Boiss.* Ballast Ground, 1865. Frequent. Dr. Engelmann states this to be a southern form widely diffused in intertropical regions.

83. Juncus Gerardi, *Loisel.* Petty's Island, 1866. Not frequent. *Hab.*—Sea coast from New Jersey northward; Gray.

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84. Cyperus fuscus, *L.* Kaighn's Point, 1865. In mature fruit. Adv. from Europe.

85. Cyperus Nuttallii, *Torr.* Ballast Ground, Sept. and Oct., 1865, 1866. Abundant in 1865, less so in 1866. Also at Petty's Island in 1866, but not very frequent. Fruit matured in every case. *Hab.*—Salt marshes from Massachusetts southward; Gray.

86. Cyperus Michauxianus, *Schultes.* Ballast Ground, 1864, 1865. Frequent along the margins of the pond. Fruit perfected. Less common in 1866. Marshes especially along the coast, from New England southward; Gray.

87. Cyperus rotundus, *L*, var. Hydra, *Gray.* Ballast Ground and Kaighn's Point, Sept. and Oct., 1865, 1866. Abundant in both places in 1865; less frequent in 1866. Fruit matured, though most of the scales were empty. *Hab.*—Sandy soils along the coast from North Carolina to Florida; Chapman.

88. Cyperus compressus, *L.* Ballast Ground and Kaighn's Point, 1864, 1865, 1866. Frequent but least common in the latter year. Abundant at Petty's Island in 1866. Fruit perfected in each season. Found also in Maryland by Mr. Canby. *Hab.*—Florida to North Carolina and westward; Chapman.

89. Cyperus Baldwinii, *Torr.* Ballast Ground, 1864, 1865. Frequent in the sandy ground near the bulk-head, fruit perfected. *Hab.*—Florida to North Carolina and westward, Chapman.

90. Hemicarpha subsquarrosa, *Nees.* Petty's Island, Oct. 21, 1866. Scarce. Fruiting perfectly. Not before found near Philadelphia.

91. Lipocarpha maculata, *Torr.* Petty's Island, Oct 21, 1866. Scarce. Fruit perfected. *Hab.*—North Carolina to Florida; Chapman.

92. Fimbristylis spadicea, *Vahl.* Ballast Ground, 1865. Searce, fruit perfected. *Hab.*—Salt marshes along the coast from New York southward; Gray.

93. Fimbristylis congesta, *Torr.* Ballast Ground and Kaighn's Point, 1865. Not scarce. In 1866 less common. Also at Petty's Island in 1866 but not frequent. *Hab.*—Florida and Westward; Chapman.

94. Fuirena squarrosa, *Mx.* Petty's Island, Oct., 1866. Scarce, fruit not matured. (Kaighn's Point in 1818. Barton in Flor. Phil. p. 37.) *Hab.*—Massachusetts and southward; Gray.

95. Alopecurus geniculatus, *L.* Ballast Ground. Collected by Dr. Martindale in 1865. Not before found in Pennsylvania.

96. Sporobolus Indicus, *Brown.* Ballast Ground and Kaighn's Point, 1865. Petty's Island, 1866. Not scarce, fruit perfected. The specimens from Petty's Island are prostrate, as in many maritime plants. *Hab.*—North Carolina to Florida; Chapman.

97. Spartina juncea, *Willd.* Ballast Ground, 1865, 1866. Sparingly distributed along the margin of the pond. Less frequent in the latter year. *Hab.*—Salt marshes and sea coast; Gray.

98. Eustachys petræa, *Desv.* Ballast Ground, 1865. Leaves and imperfect fruit; developed under glass by Dr. Leidy, it produced perfect fruit in 1866. *Hab.*—North Carolina to Florida along the coast; Chapman.

99. Cynodon Dactylon, *Pers.* Fully naturalized and abundant throughout the waste grounds below the Navy Yard. Also at Kaighn's Point, 1864, 1865, 1866. This plant was found at New Castle, Del., by Mr. C. E Smith, in 1864. A second form of it, nearly smooth and more robust, having pointed

paleæ and the flowering culms included in their sheaths, grows sparingly along the margins of the pond and elsewhere in the vicinity in damp places. Mr. Burk has observed this second form for twelve or fifteen years past on the hard dry surface of the Point Road below the old Southwark Canal. He states it to have been more abundant in 1866 than ever before. *Hab.*—Pennsylvania and southward; Gray. Nat. from Europe.

100. Dactyloctenium Ægyptiacum, *Willd.* Ballast Ground and Kaighn's Point, 1864, 1865, 1866. Common in both localities. Rather less frequent in 1866 than before. *Hab.*—Virginia, Illinois and southward; Gray.

101. Leptochloa mucronata, *Kunth.* Kaighn's Point, 1865. Not frequent. *Hab.*—Virginia to Illinois and southward; Gray.

102. Leptochloa fascicularis, *Gray.* Kaighn's Point, 1866. Collected by Mr. Burk. Scarce. *Hab.*—Rhode Island and Southward along the coast; Gray.

103. Glyceria distans, *Wahl.* Spreading over the vacant lots west of the Ballast Ground. Abundant. *Hab.*—Salt marshes along the coast; Gray.

104. Brizopyrum spicatum, *Hook.* Ballast Ground, 1865, 1866. Staminate plants only. *Hab.*—Salt marshes; Gray.

105. Paspalum distichum, *L.* Ballast Ground, 1864, 1865, 1866. Along the wet margin of the pond, in similar places at Kaighn's Point, and in 1866 at Petty's Island. Abundant and with mature fruit. *Hab.*—Virginia and southward; Gray.

106. Panicum amarum, *Ell.* Ballast Ground, 1865. Two flowering specimens. Again in 1866, but only one or two plants not in flower. *Hab.*—Sandy shores, Connecticut and southward; Gray.

The Cutting Ant of Texas—OECODOMA TEXANA, Buckley.

BY GIDEON LINCECUM.

In many portions of Texas this species of ant is quite numerous and troublesome. It is capable of and actually does perpetrate more real perplexing injury to the horticulturist and farmer, than all the other types of Texan ants put together. In form and color the larger varieties of them do not differ in appearance very much from the agricultural ants. A great portion of our citizens speak of these two ants without distinction, as being the same species. There is, however, a well-marked difference in their community regulations; in their manners and customs, in their mode of constructing their cities, in their peculiar food and manner of preparing it, and in their civil and military governments.

There are five varieties or castes in this species, all of which may be seen in the same community, or city as I prefer to call it. They vary in size from that of a drone honey bee down to near that of the little black erratic ant; and their duties and vocations are as variant as their sizes. The largest size have wings and are the mother ants. They dwell in the ground in sandy lands, and one of their long established cities will, on an average, occupy at least two square rods of surface. The area of the city is considerably elevated; often one to two feet, and sometimes even more. The earth which is thus thrown up, and which is universally sand, is thrown out from their numerous and capacious cells below, and from their extensive tunnels or subterranean passages. To their cells they have many holes, or places of entrance, and some of them are tunnelled off several hundred yards.

It is known to many observant Texans that in all the larger cities the ants